



Newsletter

Volume 12, Number 3
May - June 1995

Director's Note

The success of Cary Conference VI, described in our cover story, was enhanced by participation from members of the IES Board of Trustees. First, the idea for the conference theme—the need for conservation and ecology to work together—was stimulated by issues raised by Mr. Edward A. Ames, Trustee of both the Institute and of the Mary Flagler Cary Charitable Trust. Then, on the first morning of the conference, a welcoming message from U.S. Secretary of the Interior Bruce Babbitt was read by Trustee Dr. Thomas E. Lovejoy. Dr. Lovejoy was followed at the podium by Chairman of the Board, Ms. Gretchen Long Glickman, who challenged the scientific community to convey science as meaningful to conservation goals and to battle misinformation. During the final afternoon, Trustee Dr. Lee M. Talbot led a panel of policy experts in a discussion of issues including how science affects policy, law and environmental management; and Mr. Ames summarized the findings of the discussion group he led about the protection of scientific credibility. Finally, Dr. Lovejoy provided a far-reaching summary of the entire conference, helping to bring focus to many of the discussions.

The IES Newsletter is published by the Institute of Ecosystem Studies, located at the Mary Flagler Cary Arboretum in Millbrook, New York. All newsletter correspondence should be addressed to the editor.

Gene E. Likens, Director
Joseph S. Warner, Administrator
Alan R. Berkowitz, Head of Education

Editor: Jill Cadwallader
Printing: Central Press

INSTITUTE OF ECOSYSTEM STUDIES
Education Program
Box R (Route 44A)
Millbrook, NY 12545-0178
(914) 677-5359

New Approaches to Ecology and Conservation United at Cary Conference

Scientists, policy experts and environmental managers gathered at the Institute of Ecosystem Studies from May 9 - 11 to apply new ideas in the science of ecology to the conservation of biodiversity. Until now, the emphasis of conservation efforts has been on specific endangered or threatened species. New developments in ecology, however, promise to help managers conserve multiple species and their ecosystems.

The point of departure for this meeting, the Institute's sixth Cary Conference, was the premise that existing conservation efforts devoted to single species, one at a time, are insufficient, and that conservation of whole ecosystems is necessary to avoid risky 11th-hour efforts to save species on the brink of extinction. Ecosystem conservation entails preserving or promoting ecological processes that are much more inclusive than species, or even their habitats. Cary Conference VI was organized by IES ecologists Dr. Richard S. Ostfeld and Dr. Steward T.A. Pickett* to identify those

* Other members of the steering committee were: Mr. Edward A. Ames, Mary Flagler Cary Charitable Trust; Dr. Charles D. Canham, IES; Dr. Norman L. Christensen, Jr., Duke Univ.; Dr. Robert K. Colwell, Univ. of Conn.; Dr. Thomas W. Hockstra, USDA Forest Service; Dr. Deborah B. Jensen, The Nature Conservancy; Dr. Gene E. Likens, IES; Dr. Pamela A. Matson, Univ. of Calif., Berkeley; Dr. Catherine M. Pringle, Univ. of Georgia; Dr. Peter H. Raven, The Missouri Botanical Garden; Dr. Moshe Shachak, Ben Gurion Univ. of the Negev, Israel; and Dr. David L. Strayer, IES.

processes and the best means of preserving them.

New theories in ecology, the scientific discipline devoted to understanding the interactions among species as well as between species and their environments, highlight the ecosystem components and processes that should be targeted by conservation efforts. Conference participants debated the popular notion that ecological systems—for example, an animal population, a lake, or a forest patch—exist in a "balanced" state. Most participants agreed that ecological systems typically are subject to natural disturbance, for example, certain disease epidemics, some fires, or catastrophic blowdowns; to the vagaries of history; and to outside forces, such as nutrient inputs or invading species. In their presentations, scientists advanced arguments that nature may not exist in the state of balance that many believe, but rather in a constant state of flux. Because disturbances and outside forces have a strong impact on biological diversity and on the ability of ecosystems to provide goods and services to people, such as food, forest products, and pollution abatement, conference participants proposed that an appropriate focus for environmental managers may be "disturbance regimes", or the types, timing, intensity, and pattern of disturbances.

A second focus of conference participants relevant to ecosystem conservation was the

continued on following page



Conference participant Dr. Hugh Possingham (left), from the Department of Applied Mathematics at the University of Adelaide, Australia, and IES ecologist Dr. Steward Pickett, one of the co-conveners of Cary Conference VI.

Cary Conference VI, *continued*

concept of "patchiness". A view of the landscape from an airplane window provides a clear portrait of patchiness: forests are fragmented by clearcuts; farmland is bisected by hedgerows and roads; suburbs contain small woodlots and stream corridors. Scientific presentations at the conference showed that patchiness affects movements of individual animals and plants, flows of nutrients and pollutants, and even the diversity of organisms. Scientists proposed that managers may be able to optimize patchiness for the maintenance of biological diversity.

Both ecologists and policy experts in attendance were concerned that the notions of ecological disturbance and patchiness may be misused by politically motivated groups. Policy experts urged scientists to be loud and clear in counteracting misleading and inaccurate statements regarding the ability of ecological systems to withstand human-caused insults. Scientific studies clearly show that natural and human-caused disturbances often are fundamentally different in magnitude and frequency from natural ones. Therefore, the assertion that ecosystems, because they can recover from natural disturbance, are resilient to *any*



TOM TAFT

ing scientific principles and information to the public, and engaging in public debate regarding conservation. One risk scientists face when engaging in policy dialogues is the perception of compromising their credibility. Nonetheless, many conference participants felt that increasing pressure is placed on scientists to enter policy discussions.

On the second night of the Conference, participants and members of the Institute's Aldo Leopold Society were treated to a talk on "The Land Ethic of Aldo Leopold" presented by his son, Dr. A. Carl Leopold. Afterwards, at a reception in the Plant Science Building, Dr. Leopold (right) spoke with Mr. Wm. Robert Irvin, J.D., Center for Marine Conservation, Dr. Diana W. Freckman, Colorado State University, and Dr. Thomas Lovejoy, Smithsonian Institution.

disturbance, is clearly unsupported. Similarly, the unfortunate terminology of "functional redundancy" to describe species whose ecological functions appear quite similar, was attacked on the grounds that it has never been demonstrated that species are entirely interchangeable.

These discussions underscored a third theme, which was the need for scientists to be more actively involved in communicat-

Cary Conferences have been held at the Institute every other May since 1985, each focusing on a different theme. Their purpose, unlike that of many scientific meetings, is to consider the process of science, rather than the detailed content, to help integrate and advance the discipline of ecology. Cary Conference VI was the first to be held in the IES Auditorium. Because of the increased space available in this new facility, it was also the largest conference to date, with 90 participants from across the United States as well as from the international community.

Presentations and discussions from the sixth Cary Conference will be published by Chapman & Hall in a book scheduled to appear in summer 1996.

Professor Rogers and the Ecology - Conservation Interface

With the official recognition in South Africa eight years ago that the environment is a legitimate user of the nation's water resources, pressure was put on ecologists to determine exactly what the water requirements of the environment were, and to compare these needs with those of industry, agriculture and other major water users. The need to develop an interdisciplinary approach to water resources in South Africa was a challenge that appealed especially to Professor Kevin Rogers.

In 1992, after working on this subject for several years, Prof. Rogers founded — with two colleagues — the Centre for Water in the Environment. The Centre's mission is the development of expertise in the field of environmentally sound water management by addressing issues dealing with the quantity and quality of water. To this end, Prof. Rogers works with hydrologists and hydraulic engineers who study the movement of water through a system; geomorphologists, whose research deals with the response of the landscape to water and sediment movement; zoologists, botanists, ecologists, and decision analysts. This interdisciplinary group focuses on two

systems, the rivers of Kruger National Park and the ephemeral flood plain of the Nyl River, both of which have conflicting water demands with development upstream and a potential impact downstream. Prof. Rogers and his colleagues consider the whole environment of these systems as one resource to be investigated.

Professor Rogers and IES

It is not always to do his or her field research that a scientist spends a sabbatical at the Institute of Ecosystem Studies: Prof. Rogers arrived at the Institute in April 1995 for five months of thinking, writing and interacting with IES ecologists. His task is to develop, by April 1996, a set of achievable and easily monitored goals for the conservation of the Kruger National Park rivers. His mission while at the Institute was to frame a theoretical background for developing those goals.

Prof. Rogers says that ecology is perceived to have failed in presenting conservation managers with achievable goals. The biggest challenge facing ecologists today is to ensure explicit application of their

research results. To achieve this, Professor Rogers believes there is a need to develop a recognizable technological interface between ecology and conservation. This interface should transform ecological understanding into usable tools for managers and ensure their application in conservation. So-called "applied" ecological research may be relevant to a problem, but ensuring application of the results is a technological, not scientific, challenge.

While at IES, Prof. Rogers worked on developing a broad framework for translating ecological research into achievable goals for conservation managers as well as on explaining the need for this pragmatic approach. During the remainder of his sabbatical, back in Johannesburg, he will work on developing the actual goals and tools for the conservation of the rivers of Kruger National Park.

Prof. Rogers' first exposure to the Institute was at the Integrated Regional Models Conference held here in October 1992, where he met IES plant ecologist Dr.

continued on following page

Dr. Rogers, continued



MOLLY AHEARN

Steward Pickett. The two shared research philosophies and interests, and Prof. Rogers invited Dr. Pickett to speak at the 20th Annual Congress of the South African Association of Botanists. After the congress, which was hosted by the Department of Botany at the University of the Witwatersrand, they toured Prof. Rogers' Kruger National Park and Nyl River research sites. Dr. Pickett reciprocated the visit by inviting Prof. Rogers to Cary Conference VI (see cover story), at which the latter spoke on "Operationalizing ecology under a new paradigm: emerging principles and examples from savannas and their rivers".

Prof. Rogers selected IES as the site for his sabbatical because he wanted his work to have a good grounding in ecology, and because the Institute has "top ecologists with fertile minds open to creative thinking and discussion and with a good range of expertise". His earlier collaboration with Dr. Pickett on patch dynamics provided a base for continued discussion, and during his sabbatical the two collaborated on a

research paper about the future of patch dynamics as a paradigm for conservation, a process that helped him to further develop the Kruger National Park goals. He and IES aquatic ecologist Dr. Stuart Findlay also made plans for future collaboration; Dr. Findlay's ongoing research in the Tivoli Bays (Hudson River at Red Hook, New York) faces similar issues of interfacing with conservation and management to those experienced in the Kruger National Park.

* * * *

Professor Kevin H. Rogers, co-director of the Centre for Water in the Environment, is also professor of Botany at the University of the Witwatersrand in Johannesburg. In addition to doing his research on water resources, he teaches undergraduate and graduate courses.

IES "Best Project" Award

Ms. Martina Kim, a junior at Arlington High School in LaGrangeville, N.Y., was this year's recipient of the Institute of Ecosystem Studies' award for "Best Project in Environmental Science and Ecology" at the 1995 Dutchess County Regional Science Fair. Ms. Kim's project was called *Aquatic herbicide effect on Daphnia phototaxis*.

The site of Ms. Kim's research was Lake George, just north of Albany, N.Y., where Eurasian watermilfoil — introduced to the United States in the 1940s — has had a significant negative ecological impact on other aquatic plants and on animal life. Among the proposed solutions for controlling the growth of this invasive plant is treatment by the aquatic herbicide fluridone (sold under the trade name of Sonar®). Ms. Kim's research subjects were *Daphnia*, freshwater crustaceans barely visible to the naked eye, and her project was designed to study the impacts of fluridone on the phototactic behavior (the response to light) of these animals. She subjected *Daphnia* to three concentrations — 10, 100 and 10,000 parts per billion (ppb) — of the herbicide by feeding them with algae treated with fluridone. Changes in phototactic behavior were observed at 100 ppb, suggesting to Ms. Kim that further testing of the impact of fluridone on the biochemistry of the animals' vision is necessary.

Institute staff serving as judges for the IES award at the Dutchess County Regional Science Fair were scientists Dr. Stuart Findlay, Dr. Gary Lovett, and Dr. Cathleen Wigand; ecology educator Ms. Ana Ruesink, and graduate student Mr. Bill Sobczak. Dr. Lovett said that Ms. Kim's project was "well designed and executed and professionally displayed", adding that her poster was the equal of most at Ecological Society of America meetings. Late in April, Ms. Kim and her parents visited the Institute where Dr. Michael Pace presented her with a Certificate of Recognition and a \$50 award.

In addition, Honorable Mention Certificates were sent to: Nicole Ferri, 8th grade, Haviland Middle School: *Does cigarette smoke affect the germination of seeds?*

Lauren Licurse, 6th grade, St. Columba's School: *How efficient is beta-carotene for preventing cancer in plants?*

John Sheedy, 8th grade, Regina Coeli School: *How acid rain affects photosynthesis and plant growth.*



JILL CADWALLADER

Science Fair winner Ms. Martina Kim was presented with the Institute's "Best Project in Environmental Science and Ecology" Award at a Friday afternoon seminar in the IES Auditorium. Before the seminar began, Ms. Kim discussed her research with staff and guests. Among the first on the scene were two of the IES judges, Dr. Cathleen Wigand, left, and Dr. Stuart Findlay, right.

Calendar

CONTINUING EDUCATION

Fall semester catalogues have been sent to all IES members and Continuing Education Program students. Copies also are available at the Gifford House. Some of the fall classes, workshops and trips are:

Landscape Design

- Oct. 10 (8 sessions): Principles of Landscape Design
- Oct. 28: Native Plants in Design Gardening
- Sept. 30: Cold Frame Rewards
- Oct. 5: Native Plant Propagation
- Oct. 12 (5 sessions): Plant Propagation
- Oct. 15: Naturescaping for Wildlife Biology and Earth Science
- Sept. 30: Using Local Schoolyard Trees to Teach Hands-on Science Workshops
- Sept. 30: Pond Management and Restoration Trips
- Oct. 14: Noah's Garden: An Ecological Model for Transforming the Suburban Landscape
- Oct. 21: Exploration of Oak Forests Along an Urban-to-Rural Gradient

Other programs are scheduled for November and December. Call 914/677-9643 for information.

SUNDAY ECOLOGY PROGRAMS

Free public programs are held on the first and third Sunday of each month, except over holiday weekends. Last-minute changes are sometimes unavoidable, so call 914/677-5359 to confirm the day's topic. In case of poor weather, call 677-5358 after 1 p.m. to learn the status of the day's program. The following programs begin at 2 p.m. at the Gifford House, except as otherwise noted*:

- Oct. 1: Small Mammals of New York's Forests and Fields, a walk led by Dr. Richard Ostfeld (* meet at the Greenhouse parking lot, Route 82)

*For general information, call the IES Education Program Office at the Gifford House Visitor and Education Center:
914/677-5359 weekdays from 8:30 a.m. - 4:30 p.m.*

Sunday Ecology Programs, continued:

- Oct. 15: Nature's Continuum I: Fall Transitions, a walk led by Mr. Michael Weintraub
- Nov. 5: Nature's Continuum II: Fall into Winter, a walk led by Mr. Michael Weintraub

- We strongly recommend that participants in outdoor programs wear sturdy footwear and long pants tucked into socks.

IES SEMINARS

The Institute's program of free scientific seminars features presentations by visiting scientists each Friday at 3:30 p.m. at the IES Auditorium:

- Sept. 29: Avian Ecology in Northern Forests: Interactions with Plants, Habitat and Fish. Speaker: Dr. Mary F. Willson, Forestry Sciences Laboratory, Juneau, Alaska, and IES Visiting Distinguished Scientist
- Oct. 6: Small Mammals, Soils and Vegetation in Oldfields at the Cedar Creek Natural History Area, Minnesota. Speaker: Dr. Richard A. Inouye, Idaho State University
- Oct. 13: Microbial Community Structure: How Far Have We Come in Our Understanding? Speaker: Dr. Mike Klug, Kellogg Biological Station
- Oct. 20: Population Cycles in Voles. Speaker: Dr. Robert H. Tamarin, Boston University
- Oct. 27: How (and Why) to Wrestle a Moose. Speaker: Dr. John Pastor, University of Minnesota

VOLUNTEER OPPORTUNITIES

The IES Volunteer Program is looking for enthusiastic women and men interested in working with Institute staff for a few hours (or more) each week at the Gifford House Visitor and Education Center. The wish list includes salespeople in the Gift and Plant Shop; gregarious individuals to greet visitors and assist with public education programs; and those whose organizational abilities help to make office work go more smoothly. For information on responsibilities and benefits, call Su Marcy, IES volunteer coordinator, at 914/677-5359.

GREENHOUSE

The IES greenhouse, a year-round tropical plant paradise and a site for controlled environmental research, is open until 4:00 p.m. daily except public holidays. Admission is by free permit (see below).

HOURS

Summer hours: May 1 - September 30

Closed on public holidays.

Public attractions are open Mon. - Sat., 9 a.m. - 6 p.m. & Sun. 1 - 6 p.m., with a free permit.

The IES Gift and Plant Shop is open Mon.-Sat., 11 a.m. - 5 p.m. & Sun. 1 - 5 p.m. (The shop is closed weekdays from 1 - 1:30 p.m.)

• All visitors must pick up a free permit at the Gifford House Visitor and Education Center on Route 44A for access to IES public attractions. Permits are available until 5 p.m. daily.

IES GIFT AND PLANT SHOP

New in the Shop ... floral duffles and tote bags ... botanical bath oils ... embroidered IES T-shirts ... photo notecards of local attractions ... washable fabric lunch-bags ... and for children ... "Glovables" animal puppets ... nature and gardening books ... posters Senior Citizens Days: 10% off on Wednesdays

MEMBERSHIP

Become a member of the Institute of Ecosystem Studies. Benefits include a member's rate for IES courses and excursions, a 10% discount on Gift Shop purchases, a free subscription to the IES Newsletter and participation in a reciprocal admissions program, with benefits at over 100 nature centers, forest preserves, gardens and conservatories in the U.S. and Canada. Individual membership is \$30; family membership is \$40. For information, call Ms. Janice Claiborne at 914/677-5343.

The Institute's Aldo Leopold Society: In addition to receiving the benefits listed above, members of The Aldo Leopold Society are invited guests at spring and fall IES science updates. Call Ms. Jan Mittan at 914/677-5343 for information.

Nonprofit Org.
U.S. Postage
PAID
Millbrook, N.Y.
Permit No. 16

INSTITUTE OF
ECOSYSTEM STUDIES
Education Program
Box R
Millbrook, New York 12545-0178



Newsletter

Volume 12, Number 3
May - June 1995



100% Recycled
Paper